

The thread which receives the objectives is of the gauge commonly used in this country, but an adapter can also be supplied which will carry the objectives of Hartnack and other continental opticians.

The stage is circular and capable of rotation, and it is divided on the margin to  $360^\circ$ . A vernier is attached to the front of the stage, giving readings to one minute. The edge of the stage is milled, and rotation is imparted by hand.

To insure concentric rotation with any powers used, two screws, carrying milled heads, are connected with the back of the stage. By the employment of these adjusting screws and the cobwebs in the eye-piece, a small object may readily be centred, so that it will revolve about a point central to the field afforded by any objective.

The object is held either by sliding clamps or by spring clips, and is moved about by hand. With a little practice this simple method of moving the object will be found to answer every purpose.

The polariser slides into a fitting which is fixed to an arm pivotted on the lower, movable surface of the stage, so that it can readily be displaced when ordinary transmitted illumination is required, and replaced with equal facility.

Two little lenses, affording a strongly-convergent pencil of light, are set in metal rings which drop into the top of the fitting which surrounds the polarising prism. When these are employed and the analyser is used, without lenses in the eye-piece (a separate fitting is supplied for this purpose), examinations of the rings and brushes, presented by sections of certain crystals, can be advantageously carried on, and a quarter-undulation plate can also be employed when needful. The lower end of the fitting which carries the polariser is surrounded by a divided disk, turning beneath a fixed index, so that any position of the prism can be recorded and the rotation imparted to it can be measured. Several other useful pieces of apparatus can be added to the stand at a moderate cost.

From the foregoing description it will be seen that this instrument is capable of performing the functions of an ordinary microscope, a polariscope, a stauroscope, and, to some extent, a goniometer. A spectroscope could be fitted to it if needful, as well as an apparatus for heating sections of crystals. For a few pounds separate binocular tubes can be supplied, to replace, in a few seconds, the single, but more generally useful, tube. The objectives of any maker can be used with the instrument.

Having carefully tested one of these microscopes I can speak most favourably of its performance. It is strongly constructed, convenient to handle, and the adjustments work very smoothly. The price of this stand is also remarkably moderate when compared with that of many microscope-stands of far less universal application. It appears to me well qualified to answer the requirements of students of mineralogy and petrology, and it is also applicable to other studies for which microscopes are commonly required.

Mr. Watson has taken especial pains to turn out a sound and serviceable instrument, and, after long experience of microscopes, I can confidently say that I have never seen one better suited for the work for which it is designed.

FRANK RUTLEY

### STELLAR MAGNITUDES

#### A REQUEST TO ASTRONOMERS

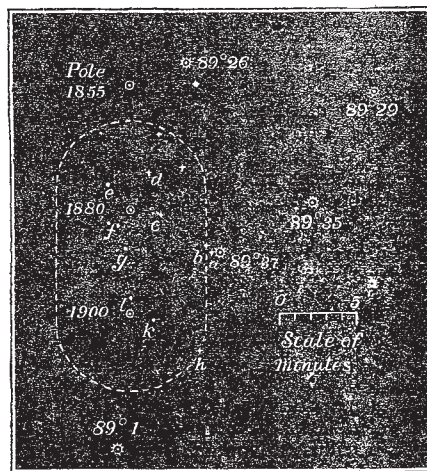
THE scales adopted by different observers in their estimates of stellar magnitudes differ considerably from each other, as is well known. As regards the brighter stars, these differences, indeed, are comparatively unimportant; but they become larger and more perplexing when the objects observed are faint. Variations of three or four magnitudes may be expected between

the estimates made of the brightness of minute companions seen near a brilliant star. It is needless to point out the inconvenience of this state of affairs, which at times nearly deprives the estimated magnitudes, found in catalogues, of their meaning, and consequently of their value.

In the hope of providing a partial remedy for this defect, a series of photometric observations of stars of various magnitudes, situated near the north pole, has been undertaken at the Harvard College Observatory. The region has been selected as one which may always be conveniently observed in the northern hemisphere, so that the brightness of a star observed in another part of the sky can readily be compared by estimate with any standard polar stars, the relative brightness of which may have been determined by photometric measurements.

The table and chart given below are designed to serve as guides in finding the stars which are, as has been said, in course of photometric measurement at the Harvard College Observatory. The stars given in the table are arranged approximately in the order of their brightness, the first being  $\alpha$  Ursæ Minoris, which is taken in all cases as the standard of comparison, and the next three,  $\delta$  Ursæ Minoris,  $51$  Cephei, and  $\lambda$  Ursæ Minoris. The chart is a copy of a sketch showing the approximate relative position of ten faint stars very near the pole, which are denoted by the italic letters *a, b, c, d, e, f, g, h, k, l*. The places

DM.	$\alpha$ 1880. h. m.	$\delta$ 1880.
88° 8' ... ..	1 14 ... ..	88° 40'
86 269 ... ..	18 11 ... ..	86 37
87 51 ... ..	6 44 ... ..	87 14
88 112 ... ..	19 44 ... ..	88 57
88 4 ... ..	0 51 ... ..	88 23
88 9 ... ..	2 3 ... ..	88 36
89 3 ... ..	2 28 ... ..	89 36
89 35 ... ..	17 50 ... ..	89 48
89 37 ... ..	19 28 ... ..	89 54
89 1 ... ..	0 19 ... ..	89 45
89 26 ... ..	13 23 ... ..	89 49



of the pole for 1855, 1880, and 1900, and of five stars from the Durchmusterung, four of which occur in the table, are also indicated upon the chart, to facilitate the identification of the faint stars. The objects called *c* and *e* are nearly in the prolongation of the line through DM.  $89^\circ 37'$  and *b*. Between these last, and more nearly in the same line than it appears to be in the chart, lies the star *a*.

The value and interest of the photometric results to be obtained at the Harvard College Observatory may be greatly increased by the co-operation of astronomers elsewhere. All who are desirous of improving the present

system of comparing the brightness of stars, are therefore requested to make estimates of the magnitude of as many as may be convenient of the stars above mentioned. It is desirable that the estimate should be made, for each star which may be observed, on five different nights, and that each estimate should be, if possible, entirely independent of those previously made. It will add to the value of the work if, on every occasion when the fainter stars are looked for, a record is made of such of them as can then be seen, even if no estimate of their magnitude is attempted.

Observers are also requested to note the approximate places of any stars not represented upon the chart, but within five minutes of the place of the pole at any time between 1880 and 1900. The boundary of this region is represented on the chart by a dotted line. The stars not shown within it have been omitted as unnecessary for the purpose of finding the others, and several of these omitted stars are inconveniently faint for photometric observations; but records of their visibility at any time and place will be valuable as evidence of the state of the atmosphere and character of the instrument employed in the observations.

All astronomers who may be induced by this request to make any observations of the kind just described will confer a favour upon the Harvard College Observatory by sending to it a copy of their records, accompanied by a statement of any modification of the proposed method of observation which they may have adopted, as well as any additional details which may appear desirable, with regard to the instruments employed, &c. Unless the contrary is requested, the results will be published with the photometric measurements obtained at the Harvard College Observatory; and a copy of the publication will be sent to each observer who has co-operated in the work.

It is hoped that a large number of those astronomers whose experience has been sufficient to establish a definite scale for their estimates of stellar magnitude will consent to take part in the proposed observations, in order that the published series of observations may be complete enough to be of general utility.

EDWARD C. PICKERING  
Director of the Harvard College Observatory

### GEOGRAPHICAL NOTES

At the meeting of the Royal Geographical Society on Monday evening it was announced that the gold medals had that day been awarded to Col. Nicholas Prejevalsky for the great additions he has made to our knowledge of Central and Eastern High Asia by his successive expeditions into the unexplored parts of the great plateau of Mongolia and the lofty deserts of Western Thibet, and for the admirable way in which he has described the regions traversed by him in the published narratives of his journeys; and to Capt. W. J. Gill, R.E., for excellent geographical work performed during two journeys of exploration, voluntarily undertaken, along the northern frontier of Persia in 1873, and over previously untravelled ground in China and Thibet, in 1877; also for the elaborate memoir and route maps contributed to the forthcoming volume of the Society's *Journal*. A paper was afterwards read by the Rev. James McCarthy, of the China Inland Mission, descriptive of the journey which he made, mostly on foot, in 1877, across China, from Chinkiang, on the Yangtze-Kiang, to Bhamò, in Burmah. The leading features of this journey have been fully described in *NATURE*. The most noteworthy incident of the evening was a speech, delivered in his native language by the Marquis Tsêng, Chinese Minister to England and France, expressive of the pleasure which he felt at Mr. McCarthy's acknowledgment of the uniformly courteous treatment he experienced during his long journey.

At the next meeting of the Geographical Society on May 12, the second of the course of scientific lectures of the present session will be delivered by Prof. G. Rolleston, of Oxford, on the "Modifications of the External Aspects of Organic Nature produced by Man's Interference."

News has arrived by the last mail from Zanzibar that Mr. H. M. Stanley is busily occupied in engaging porters for a journey into the interior of Africa, but that he preserves the utmost secrecy as to his intended movements. A rumour is current amongst the porters that their journey is to commence from the west coast; if this be the case, Mr. Stanley must have introduced a radical change into the original plans of the Belgian section of the International African Association, for whom he is believed to be acting. That, accidents apart, he will be more successful than the unfortunate leaders of the first Belgian expedition few will be so rash as to doubt, and he is sure to have good and sufficient reasons for the course he is adopting.

DURING the past few days there has been a considerable exodus of missionary explorers. Dr. James Stewart, the well-known head of the Livingstonia station, has returned to his post, and will soon be adding more to our knowledge of the shores of Lake Nyassa. Dr. Joseph Mullens, of the London Missionary Society, who has already done good service to geography in Madagascar, has started for Ujiji, on Lake Tanganyika, and before returning home he will probably make his way down to the north end of Lake Nyassa, thus filling up an important blank in our knowledge of the lake region. Lastly, the Rev. T. J. Comber, of the Baptist Missionary Society, has returned to Western Africa to found a station at San Salvador, and eventually to conduct a missionary expedition to the upper waters of the River Congo.

THE general report of last year's operations of the Marine Survey of India, under Commander A. Dundas Taylor, late I.N., has just reached this country. During that period two parties carried out the following surveys: Ratnagiri, including Mirya and Kalhadevi Bays; Viziadurg, including Rajapur and Ambol Ghur Bays; Paumotu Pass (between Ceylon and the mainland) and its approaches; Beypore, Calicut, and Cochin. The natural history investigations of the season have been confined to an examination of the fauna inhabiting the shores in the vicinities of Ratnagiri and Viziadurg, and to the collection and preservation of the various ornithological specimens procured. The area examined includes the tract of country lying between the above places from the sea to the chain of hills known as the Western Ghâts. The examination of the sea-bottom with the dredge was impracticable, owing to the want of a vessel; this want, however, has since been supplied, as was recorded in *NATURE*, vol. xix. p. 298, and no doubt interesting results will be obtained during the present season. Captain Taylor's report is accompanied by a useful map showing the surveys completed by his officers, together with the sheets published or in course of publication, 1877-8.

THE second session of the Congress of Commercial Geography, inaugurated at Paris last year, will be held at Brussels in September, under the presidency of M. Bamps, and arrangements for the meeting have already been commenced.

News has been received from Queensland that the remains of the two Prouts, well-known explorers, have at length been discovered, so that the question of their fate is now finally set at rest.

At the last meeting of the Société de Géographie Commerciale at Paris Dr. Harmand gave some account of his observations in the Laos country of the Indo-Chinese peninsula. He stated that though elephants were common there, ivory was dearer than in Paris, and that the same remark applied to rhinoceros-horn. There are mines of lead, iron, and copper in the country, and probably gold